

A proper *prima facie* case of obviousness over a single cited reference requires that the reference must “teach or suggest all the claim limitations.” If all limitations are not explicitly met, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference teachings to reach the claimed invention. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the present §103(a) rejection of independent claims 1-5 and 15-20, in that the Bakhru reference fails to teach or suggest all the claim limitations, and in that no cogent motivation has been identified for modifying the reference teachings to reach the claimed invention. Further, even if it is assumed that a proper *prima facie* case has been established, there are particular teachings in the Bakhru reference which controvert the obviousness argument put forth by the Examiner.

Independent claim 1 is directed to a method for providing adaptation of an antenna array in a base station associated with a cell of a cellular wireless communication system. The method includes the following steps, denoted (a) through (e) herein for ease of discussion:

- (a) estimating a spatial covariance matrix for each of a plurality of mobile stations communicating with the base station, the spatial covariance matrix for a given one of the mobile stations being determined at least in part based on a unique hopping sequence of the mobile station and providing a correlation between signals received from the mobile station at different antenna elements within the antenna array;

- (b) processing the estimated spatial covariance matrices to generate an estimate of an interference matrix for the plurality of mobile stations;

- (c) estimating an array response for the given mobile station from the interference matrix;

- (d) processing the array response for the given mobile station to generate an antenna weighting associated with the given mobile station; and

- (e) applying the antenna weighting to a signal received from the given mobile station in order to facilitate detection of a corresponding transmitted symbol.

The Examiner in formulating the §103(a) rejection in effect argues that Bakhru discloses each and every one of the steps (a) through (e) above, but just not in the context of a wireless

cellular system having a base station and mobile stations. Applicants respectfully disagree. The particular steps set forth in the claim are simply not shown in Bakhru. For example, step (a) refers to the estimation of a spatial covariance matrix for each of a plurality of mobile stations communicating with the base station. The Examiner points to the left column of page 376 and Equation (3a), but the relied-upon portion of Bakhru fails to meet the particular limitation in question. Similarly, the Examiner argues that step (b), which calls for processing the estimated spatial covariance matrices to generate an estimate of an interference matrix for the plurality of mobile stations, is shown in the algorithms disclosed on pages 376 and 377, and more particularly in Equation (8) and its associated text. Again, the particular limitation in question is not met. The Bakhru reference is similarly deficient with regard to steps (c), (d) and (e). Thus, the Bakhru reference does not “teach or suggest all the claim limitations” (a) through (e) as would be required for establishment of a proper *prima facie* case of obviousness.

Also, as indicated previously, the Examiner has failed to identify a cogent motivation for modifying the reference teachings to reach the claimed invention. The Examiner at page 4 of the Office Action states that it would be obvious to modify the teachings of Bakhru to reach the claimed invention because the Bakhru teachings “have the same applications and purposes as the base station with array of antenna and a cell of frequency hopped wireless system.” To the extent this statement is understood, it is believed to be incorrect. Moreover, it is an entirely subjective and conclusory statement.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination “must be based on objective evidence of record” and that “this precedent has been reinforced in myriad decisions, and cannot be dispensed with.” In re Sang-Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that “conclusory statements” by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved “on subjective belief and unknown authority.” Id. at 1343-1344. There has been no showing in the present §103(a) rejection of objective evidence of record that would motivate one skilled in the art to modify the Bakhru teachings to produce the particular limitations (a) through (e) of claim 1. The above-quoted statement of obviousness given by the Examiner in the Office Action is precisely the type of subjective, conclusory statement that the Federal Circuit has indicated provides insufficient support for an obviousness rejection.

Further, even if it is assumed that a proper *prima facie* case has been established, there are particular teachings in the Bakhru reference which controvert the obviousness argument put forth by the Examiner. More specifically, the portions of the Bakhru reference relied upon by the Examiner teach processing steps which differ considerably from steps (a) through (e) of claim 1. Bakhru thus teaches away from the claimed invention, and such a teaching away constitutes evidence of non-obviousness.

Accordingly, it is believed that independent claim 1 is not obvious in view of Bakhru.

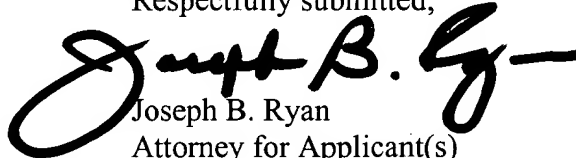
Dependent claims 2-5 are believed allowable for at least the reasons identified above with regard to claim 1.

Independent claims 15 and 16 each include limitations similar to those of claim 1, and are believed allowable for at least the reasons identified above with regard to claim 1.

With regard to independent claims 17-20, each of these claims includes limitations relating to determining a spatial covariance matrix for each of a plurality of mobile stations communicating with the base station, the spatial covariance matrix for a given one of the mobile stations being determined at least in part based on a unique hopping sequence of the mobile station and providing a correlation between signals received from the mobile station at different antenna elements within the antenna array, and processing the estimated spatial covariance matrices to determine an antenna weighting associated with the given mobile station, with the antenna weighting being applied to a signal received from the given mobile station in order to facilitate detection of a corresponding transmitted symbol. For reasons similar to those described above in the context of claim 1, Bakhru simply fails to teach or suggest these limitations.

In view of the above, Applicants believe that claims 1-20 are in condition for allowance, and respectfully request withdrawal of the §103(a) rejection.

Respectfully submitted,



Joseph B. Ryan
Attorney for Applicant(s)
Reg. No. 37,922
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-7517

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